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Wagner, Michael; Huinink, Johannes; Liefbroer, Aart C.

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Research Article

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Michael Wagner

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Michael Wagner[1]

Johannes Huinink[2]

Aart C. Liefbroer[3]

Abstract

BACKGROUND
A considerable proportion of childless women in their late thirties or early forties would still like to have children. The number of men and women whose fertility intentions are potentially influenced by the so-called biological clock for childbearing and who remain involuntarily childless is increasing.

OBJECTIVE
We analyze the short-term dynamics of fertility intentions and partner search among childless, non-partnered men and women aged 35–37. By comparing people in this age group to younger men and women, we investigate whether and how their awareness of the biological clock for childbearing affects their childbearing intentions.

METHODS
The data stems from the first two waves of the German Panel Analysis of Intimate Relationships and Family Dynamics (pairfam) survey. We selected male and female respondents aged 25–27 (n = 1,073) and 35–37 (n = 369) in Wave 1.

RESULTS
Our analyses reveal that fertility intentions are more polarized among men and women aged 35–37 than among their 25–27-year-old counterparts, and are more polarized among women than among men. Finding a partner is shown to positively affect fertility intentions. Our results suggest that people who intensify their fertility intentions are not

[1] University of Cologne, Germany. Email: mwagner@wiso.uni-koeln.de.
[2] University of Bremen, Germany. Email: huinink@uni-bremen.de.
[3] Netherlands Interdisciplinary Demographic Institute, The Hague, University Medical Centre Groningen, University of Groningen, and Vrije Universiteit, Amsterdam, the Netherlands. Email: liefbroer@nidi.nl.

necessarily successful in finding a partner, which can be seen as a major prerequisite for family formation.

CONTRIBUTION

This is one of the first studies to investigate the fertility intentions of childless men and women whose biological clock is running out. It provides an instructive example for a longitudinal study of the dynamics of life-course-related intentions.

1. Introduction

In many Western European countries the proportion of first births to women aged over 35 has been growing since the 1960s (Prioux 2005). At the same time, a considerable proportion of childless women in their late thirties or early forties would still like to have children (Ruckdeschel 2007: 218). The number of men and women whose family-formation intentions are potentially affected by the so-called biological clock for childbearing, and who remain involuntarily childless, is increasing (Te Velde et al. 2012). For women, the biological clock for childbearing denotes the time period between puberty and menopause. Men also seem to be affected by biological deadlines for paternity (Rotkirch et al. 2011).

In this paper we investigate the short-term dynamics of fertility intentions and of partner search among 35–37-year-old childless men and women without a partner. For women in this age range the decline in fecundity is accelerating (Balasch 2010), but there is still a realistic chance of having a child. The fertility intentions and behavior of this group of partnerless and childless men and women might be more influenced by the ticking of the biological clock than those of men and women who are already parents or who are too old to have a realistic chance of having a child. We investigate which individual and social factors have the greatest impact on men and women who face decreasing opportunities to achieve the major developmental goal of becoming a parent.

Research on the behavioral influence of the biological clock on men and women in their late thirties is limited. For Norway, Dommermuth, Klobas, and Lappegård (2011) demonstrate that age positively affects the fertility intentions of childless individuals. By contrast, Liefbroer (2009) finds for the Netherlands that childless men and women in their thirties lower their family size intentions. For Britain, Iacovou and Tavares (2011) detect a very modest drop in expected fertility after age 30.

In the next section we propose a theoretical framework, inspired by the theory of developmental regulation proposed by Heckhausen and others (Heckhausen, Wrosch, and Fleeson 2001; Liefbroer 2009), to explain the dynamics of fertility intentions over time. Following the Theory of Planned Behavior, we introduce further relevant

determinants of fertility intentions (Ajzen 1991; Dommermuth, Klobas, and Lappegård 2011). With regard to the transition to partnership, we briefly discuss partner matching and how it is affected by the opportunity structure of the partner market. We then examine whether their realization that they are running out of time to have a child because of their biological fertility limitations intensifies or weakens partnerless and childless men and women's intention to start a family, and whether a transition to a partnership affects this intention. In a second step we analyze the transition to a partnership among this group. Our data stems from the German Panel Analysis of Intimate Relationships and Family Dynamics survey, a longitudinal study started in 2008.

2. Theoretical approach and hypotheses

Biology restricts the age range within which women can become pregnant. In Western countries the mean age at menopause is about 50–51 years (Billari et al. 2007). Fertility rates drop steeply after the age of 35, and between ages 45 and 54 fertility rates are extremely low (Fretts, Zera, and Heffner 2008). The biological clock ticks more slowly for men than for women (Balasch 2010).

2.1 The Biological Clock Hypothesis

Based on the model of developmental regulation, Heckhausen, Wrosch, and Fleeson (2001) argue that for "predeadline" women who have not yet had a child, the goal of starting a family becomes increasingly dominant relative to other life goals. In principle there are three possible reactions people might have to nearing the end of their reproductive years. First, people might remain unaffected by the urgency of the biological clock, and their fertility intentions would thus remain constant. Second, people's intentions to have a child within a short period of time might intensify, which could be accompanied by an intensification or activation of their search for a suitable partner. Third, people might feel that having a child is unrealistic in the short run, which could cause them to downplay or abandon any plans they might have had to start a family (Spéder and Kapitány 2014). Given these different types of reaction, we expect that among childless men and women aged 35 to 37 – i.e., men and women whose biological clock is ticking – we will observe for a short period of time

- increasing polarization between those who no longer want to have a child and those who intend to have a child within a short space of time; and
- an intensification of the partner search among those who want to have a child.

Several factors contribute to changes in fertility intentions when people enter their late thirties. In particular, gender, personality, and life course experiences affect how people deal with the perceived time squeeze. Gender matters because the biological clock of men ticks more slowly than that of women. Personality traits likely also matter. Following the developmental-regulation theory, individual control strategies regulate how people deal with a developmental goal like the intention or desire to start a family (Heckhausen, Wrosch, and Fleeson 2001). When people employ primary control strategies, such as the tenacious pursuit of a goal, they become increasing engaged in achieving their developmental goal. By contrast, people may adapt to failure by employing compensatory secondary control strategies, like disengagement from a goal. An intensification of the desire to have a child corresponds to a primary control strategy; a weakening of this desire corresponds to a secondary control strategy. In our model we include conscientiousness, one of the 'big five' personality traits, as a proxy for people's likelihood of using primary control strategies. Conscientiousness has been shown to be negatively related to risk propensity; i.e., conscientious people are likely to avoid risks (Nicholson et al. 2005). We add self-esteem as an indicator of a successful balance between primary and secondary control (Diewald, Huinink, and Heckhausen 1996). Both indicators are expected to be positively related to a person sticking to her/his fertility intentions over her/his lifetime. Finally, previous life course experiences are expected to matter. Men and women who were successful in the past, especially in the labor or the partner market, are more likely to delay family formation (Blossfeld 1995). At the same time, we assume that they are more likely to stick to their fertility intentions because they might be more confident that they will find a partner and be successful in meeting the conditions for starting a family.

Behavioral effects can be induced not only by the biological clock, but also by societal norms regarding family formation. These norms prescribe an optimal or appropriate age that is lower than the biological deadlines for childbearing (Billari et al. 2011). As our data does not include information about perceived social norms regarding late childbearing, we cannot separate these two influences. However, the social deadlines in Germany and other European countries correspond quite well to the ages at which fecundity is declining rapidly in men and women. These social deadlines obviously reflect the biological deadlines (Billari et al. 2011).

2.2 Other factors affecting the intention to have a child

We use the Theory of Planned Behavior (ToPB) as a heuristic framework for the identification of control variables and of selectivity processes (Ajzen 1991). According to this approach, the intention to have a child is influenced by attitudes, subjective norms, and perceived behavioral control ("ToPB factors") (Liefbroer et al. 2015); the timing of family formation; and the rate of childlessness (Morgan, Sobotka, and Testa 2011). Attitudes are seen as resulting from individuals' perceptions and evaluations of the benefits and costs of having children. Subjective norms refer to social influences that affect fertility intentions which are exerted by significant others, like partners, parents, or friends. ToPB assumes that the stronger these social norms are, the more likely it is that an individual will intend to have a child in the short term. Perceived behavioral control refers to a person's perception that a certain behavior can be performed successfully, and is a consequence of the presence of enablers of and constraints on the intended actions. Examples of perceived behavioral control in this context are the perceived ability to afford a(nother) child or the perceived impact of policy measures (Dommermuth, Klobas, and Lappegård 2011). In our case, the level of fecundity and the presence of a partner are crucial objective enabling factors.

2.3 Finding a partner

We focus on childless individuals without a partner. If they want to start a family, these men and women may be expected to intensify their partner search, because being in a partnership is usually seen as a prerequisite for having a child. We investigate the prospects childless and partnerless men and women have of finding a partner, and whether their fertility intentions affect their chances of success.

To obtain an unbiased estimate of the effect of fertility intentions, we have to account in our model for the relevant covariates of finding a partner. An individual's socio-structural attributes play a major role in the mating process. Resources like educational level and activity status determine the likelihood of finding a partner and marrying (Blossfeld and Timm 2003). Personality factors also affect the chances of union formation. According to Asendorpf and Wilpers (1998), extraversion, a subscale of the 'big five,' is strongly related to the probability of finding a partner. Asendorpf and Wilpers also argue that conscientiousness is correlated with a partnership's stability. This correlation might be due to a more selective partner choice, but it might also reduce the chances of making a (good) match. Moreover, the salience of a partnership is an important predictor as it indicates a person's motivation to be active in the partner market. In addition, we assume that the number of previous partnerships is

important, as it might be associated with an individual's problems maintaining a stable partnership and with a person's level of success forming partnerships up to this point in his/her life course. The chances of finding an appropriate partner are also restricted by the partner market. With increasing age the availability of potential partners diminishes. Men and women in their late thirties are likely to be confronted with a marriage squeeze that reduces their partner search options (Klein and Stauder 2008).

2.4 Hypotheses

In summary, we formulate the following hypotheses:

> *Hypothesis 1a*: Childless men and women without a partner who are close to the biological age deadline for childbearing are more likely than younger men and women to intend to have children in the near future or to abandon any previous fertility intentions ('polarization').
>
> *Hypothesis 1b*: Age differences with respect to fertility intentions are more pronounced for women than for men.
>
> *Hypothesis 2a*: Childless men and women entering a partnership are likely to intend to have children in the near future.
>
> *Hypothesis 2b*: Childless men and women who have been successful in the job and the partner market are more likely than those who have been less successful to intend to have children in the near future.
>
> *Hypothesis 2c*: Childless men and women with high levels of self-esteem and conscientiousness are more likely than those with lower levels of self-esteem and conscientiousness to intend to have children in the near future.

With regard to the transition to a partnership, we propose that:

> *Hypothesis 3a*: Childless men and women without a partner who intend to have a child in the near future will have a higher transition rate to a partnership than those who do not intend to have a child.
>
> *Hypothesis 3b*: Age differences with respect to the transition to a partnership are more pronounced for women than for men.

3. Data and method

3.1 The German Family Panel

We use data from the first two waves of the German Family Panel (pairfam, Panel Analysis of Intimate Relationships and Family Dynamics). In Wave 1 (2008/2009), 12,402 German-speaking men and women aged 15–17, 25–27, and 35–37 were interviewed. In Wave 2 (2009/2010), 9,069 respondents from the initial sample were re-interviewed. The mean length of time between the two waves was 12.3 months. The sample was drawn from residents' registration offices. For a detailed description of the aims and methods of the study, see Huinink et al. (2011).

We restrict our analyses to men and women from the two older age groups (25–27 and 35–37 years of age) who had no partner and no biological children; who reported being able to procreate by natural means; who were not pregnant at the time of Wave 1 or between Wave 1 and Wave 2 (14 respondents had a child or got pregnant between Wave 1 and Wave 2); and who participated in both Waves 1 and 2. Attrition between waves did not depend on short-term fertility intentions, as the association between these intentions and being selected in Wave 2 was not significant ($Chi^2 = 0.20$, $p = 0.91$). We only included cases with a valid value for the variable that indicates fertility intentions (36 respondents did not answer the relevant questions). The selections resulted in a subsample of 1,442 respondents, 1,073 of whom were aged 25–27, and 369 of whom were aged 35–37.

The respondents in the selected subsample belong to the 1981–1983 and 1971–1973 birth cohorts, who differ with respect to timing of the first birth. According to our data, 17% of the members of the younger age group, compared to 20% in the older age group, had their first child by age 25. However, we assume in our analysis of the differences in fertility intentions that possible cohort effects can be neglected, as age effects are likely to be much more important.

3.2 Variables[4]

3.2.1 Fertility intentions

We used information from two questions to measure the fertility intentions of the respondents. The first question was about the number of children the respondent (realistically) expected to have: "If you think about having your own children in a

[4] See Table A-1 for descriptive information.

realistic way, how many children do you expect to have in the future?" The response categories were: 'no child/no further child;' 'one child/one further child up to four children/four further children;' 'I am not sure;' 'I have not thought about it;' and 'no answer.' The respondent's intentions concerning the timing of a future childbirth were measured by the following question: "Do you plan to have a child within the next two years?" The response categories were: 'yes, certainly;' 'yes, maybe;' 'no, not likely;' 'no, certainly not.' Based on the answers to these two questions, we constructed an indicator of fertility intentions with three categories: 'short-term intention,' 'long-term intention,' and 'no intention.' Fertility intentions were defined as short-term if the respondent said s/he was planning to have a child within the next two years ('yes, certainly' or 'yes, maybe'); and as long-term if the respondent indicated s/he was not planning to have a child within the next two years, but might have children in the future. Respondents who said they had no plans or expectations of starting a family were categorized as 'no intention.'

3.2.2 Life course achievement

We distinguished between three levels of education based on the ISCED classification (UNESCO 2006): no degree or lower secondary education (1), upper secondary education or post-secondary non-tertiary education (2), and tertiary education (3). Two variables were used to identify the respondent's occupational career. Activity status is a polytomous indicator that reflects whether the respondent was (1) currently enrolled in education or vocational training; (2) full-time employed, in military service, or self-employed; (3) part-time employed, in a precarious or low-income job; (4) unemployed; or (5) not employed for different reasons. The prestige associated with the current or last occupation was measured by the international occupational prestige scale (Ganzeboom, Graaf, and Treiman 1992). This scale is based on the assessment of the reputation of occupations made by respondents from 55 countries. It is highly correlated with income. If the respondent reported that s/he has never been employed, the variable is 0. This means that the effect of this variable depends on whether the respondent is employed full-time or part-time. Finally, we included the number of previous partnerships.

3.2.3 Personality

To measure the respondents' personality characteristics we used a three-item version of the Rosenberg self-esteem scale (Cronbach's $\alpha = 0.69$)(Rosenberg 1965) and a three-

item emotional autonomy scale (Cronbach's α = 0.65)(Noom, Dekovic, and Meeus 2001), which are available from Wave 1. Moreover, we used the subscales "extraversion" and "conscientiousness" from the shortened version of the big five inventory (Rammstedt and John 2005), which were included in the Wave 2 data. Cronbach's α was 0.73 for extraversion (four items) and 0.63 for conscientiousness (four items). We used the "conscientiousness" dimension as an indicator of primary control strategies based on items like: "I make plans and carry them out." The item "I make things comfortable for myself and tend to be lazy" was used to capture secondary control strategies.

3.2.4 Partnership orientation

To capture respondents' general interest in finding a partner, respondents were asked to what extent the statement "I would like to have a partner" applied to their situation (1 = 'not at all' to 5 = 'absolutely'). We dichotomized this variable based on whether the respondents answered 3, 4, or 5 ('wish to have a partner'). To measure the salience of a (new) partnership as a current biographical life goal, the respondents were asked to distribute 15 importance points among five fields of activity, with living in a partnership being one of them (Wendt et al. 2011). The salience of having a partnership was measured by the share of points assigned to this life goal. Further variables indicated whether the respondent was already interested in a particular person (interest of the respondent in someone: yes or no), and whether there was a person who was interested in the respondent (interest of somebody in the respondent: yes or no). To measure the respondents' perceived opportunities to find a partner, we used the item "most men/women I know are already in a relationship" on a scale from 1 = 'not at all' to 5 = 'absolutely.' To determine whether the respondents entered a LAT or a co-residential partnership up to Wave 2, we constructed a variable with 0 if there was no partnership (partnership status at Wave 2) and 1 if the respondent entered a partnership after Wave 1 and was still in this partnership at the time of Wave 2.

3.2.5 Attitudes

We used the value of children scale (VOC scale) to measure respondents' expectations regarding the costs and the benefits of having children (Nauck 2001). It consists of two scales: positive expectations and negative expectations of having children (Wendt et al. 2011). To capture the positive expectations of having children, the respondents were asked whether they expected that having children would have one or more of the

following consequences: (a) they would stay young longer; (b) they would have a very close emotional relationship with their children; (c) their standing in their social network would increase; (d) their adult children would be there for them when they were in need; and (e) they would get new ideas from their adult children. To capture the negative expectations of having children, respondents were asked whether they thought that having children would have one or more of the following consequences: (a) they would be able to afford less; (b) their nerves would be strained; (c) they would face obstacles to achieving their occupational goals; (d) their children would be annoying in public; and (e) their personal freedom would be restricted. All of the items were scored on a scale from 1 = 'not at all' to 5 = 'very strong.' A summary score was constructed by calculating the mean of these variables. Cronbach's α is 0.63 for the positive expectations scale and is 0.74 for the negative expectations scale.

3.2.6 Subjective norms

Respondents were asked whether they agreed with the following statements: "most of my friends think that I should have a child"; and "my parents think that I should have a child" (response categories ranged from 1 = 'not at all' to 5 = 'absolutely'). Again, we calculated the average score of the two items as a summary score (Cronbach's $\alpha$is 0.80).

3.2.7 Perceived behavioral control

We used an instrument covering the prerequisites for having a child. Respondents were asked: "The decision to become a parent is often tied to certain preconditions. Please indicate how completely the following conditions would need to be met in order for you to have a child." The scale consists of eight items, including "I have to be able to financially afford to become a parent"; and "having a child has to be compatible with my long-term life plans" (for the full list of items, see Wendt et al. 2011: 70f.). The respondents were also asked to indicate how important each prerequisite is to them, and whether the prerequisite has been met. Using this information, we constructed two indicators. The first indicator refers to whether the respondent had answered each of the eight items (information provided). This indicator can be seen as reflecting the respondent's level of uncertainty about his/her perceived behavioral control with respect to mastering the transition to parenthood. For those respondents who did provide the complete information, we constructed an index by summing all of the prerequisites these respondents said were relevant and had been met at the time of

interview (# prerequisites met). If no complete information was provided, this variable was set to 0, which implies that the estimated effect for this variable is conditional on the provision of complete information.

3.3 Methods

To compare initial fertility intentions in Wave 1 and changes in those intentions between waves among men and women aged 35–37 and 25–27, multinomial logistic regression was used. In addition, binomial logistic regression was used to investigate whether the fertility intentions of men and women without a partner affected the transition to a partnership.

3.4 Subsample selection and panel mortality

As we are investigating a special group of men and women, the first wave's sample of analysis is selective in several ways. Childless men and women who do not have a partner at ages 35 and older are likely to have special social or personal characteristics, which we account for in our models. Some of these individuals might be childless because they have not found an appropriate partner (Blossfeld and Timm 2003; Asendorpf and Wilpers 1998), while others might be prone to cultivating a lifestyle as a single person with no children (Poortman and Liefbroer 2010). Yet another subgroup of men and women may have postponed family formation because they were focused on pursuing other life goals during their earlier life course stages, and are now particularly concerned about approaching the end of their reproductive years.

In accordance with the literature, we found that the likelihood of being selected into our subsample of childless men and women without a partner is correlated with educational level: 19.4% of the men in the selected subsample (S) have a tertiary level of education compared to 30.8% of the men who were not selected (nonS). Men in education or training are overrepresented (10.8% in nonS, 20.7% in S). Our subsample is also selective according to a person's activity status. In the selected subsample, men in full-time employment are underrepresented (77.3% in nonS, 56.8% in S). Women in education/training (7.8% in nonS, 20.3% in S) and in full-time employment (32.1% in nonS, 56.2% in S) are overrepresented, while non-employed women are underrepresented (25.6% in nonS, 3.3% in S).

4. Results

4.1 Patterns of fertility intentions

We start with a cross-sectional analysis based on data from Wave 1. Already in the first wave, older childless men and women without a partner were more likely to have either short-term fertility intentions or no intentions to have children at all. Men and women aged 35–37 were more likely than those aged 25–27 to have short-term plans to have children (Table 1). The results also show that the proportions of men and women without any fertility intentions were larger among those aged 35–37 than among those aged 25–27. Age differences with respect to fertility intentions are found to be more pronounced for women than for men. Both of these findings are in line with our first hypothesis, as they reflect a stronger polarization of fertility intentions in the older age group (H1a). The association between fertility intentions and age group is found to be significant ($Chi^2(2) = 110.04$, $p < 0.01$; Cramer's V = 0.28). This polarization appears to be especially pronounced for women (H1b). Cramer's V is 0.41 for women and 0.21 for men.

Table 1: Fertility intentions of men and women without children and a partner by age group (Wave 1)

Fertility intentions	Men		Women		
	25–27	35–37	25–27	35–37	Total
Short-term	12.3%	25.8%	18.1%	33.3%	17.9%
Long-term	65.2%	41.7%	64.6%	18.6%	69.6%
No intentions	22.6%	32.5%	17.3%	48.1%	12.6%
N (= 100%)	709	240	364	129	1.442

Next, we estimated a multinomial logit-regression on the fertility intentions, with the long-term intention to have children as the reference category, to examine whether this polarized pattern is attributable to the composition of the sample by attitudinal and socio-structural factors or to the selectivity of the sample (Table 2). The findings indicate that the likelihood of having short-term fertility intentions or no intentions (compared to the long-term level) was higher in the 35–37 age group than in the 25–27 age group. The female variable captures the gender effect for the 25–27 age group. The women of this age group are found to be more likely than their male counterparts to have short-term family formation intentions. The gender differences appear to be even

more pronounced in the older age group, as the women in the older age group are also found to be more likely than the men to have no fertility plans (interaction effect).[5]

Most of the variables that are related to the ToPB show significant parameters in the expected direction. For example, the respondents who reported being supported in their fertility intentions by their social network were more likely to say they have short-term fertility intentions.

The results show that an important life course variable is the number of previous partnerships, as it positively affects fertility intentions. By contrast, the respondent's level of education and activity status are found to be barely related to either of the fertility intention categories. Respondents in full-time employment are shown to have a slightly higher risk than the non-employed of having short-term fertility plans. We observe marginally significant negative effects for the less educated and the unemployed, who were less prone to have short-term fertility intentions. Furthermore, having a high educational level is found to be associated with a decreased likelihood of having no fertility intentions. The regression model shows that after accounting for several relevant correlates, the structure of the effects found in our descriptive analysis presented in Table 1 remains the same.

To account for possible latent selectivity, we estimated a Heckman sample selection model (table not shown). As this test did not lead to substantial changes in our findings, we are confident that our results are not due to issues of a presumably existing self-selection of the older childless respondents without a partner. Including the interactions of all of the covariates with cohort did not lead to a significant improvement of the overall fit (LR χ^2 (26) = 26.77; p = 0.42). Including interactions of all covariates with gender also did not significantly improve the overall fit (LR χ^2 (26) = 22.87; p = 0.64).

[5] Interestingly, this polarized structure is also found among childless respondents living with a partner (estimates not shown), although it is less pronounced. The interaction effect between gender and age group (women * aged 35-37) in the short-term category is positive but not significant.

Table 2: Multinomial analysis of fertility intentions (cross-sectional; Wave 1) (N = 1,442)

Fertility intentions	*OR*	*SE*	*P > z*
1. Short-term			
Age 35–37	**2.62**	0.56	0.00
Women	**1.50**	0.29	0.04
Women * aged 35–37	**2.07**	0.77	0.05
ToPB factors			
Positive expectations	**1.41**	0.19	0.01
Negative expectations	**0.66**	0.07	0.00
Subjective norm	**1.51**	0.09	0.00
# Prereq. met	**1.14**	0.07	0.03
Information provided	1.67	0.50	0.09
Social structure			
Low education	1.65	0.45	0.07
High education	1.10	0.22	0.64
In training	0.55	0.18	0.08
Full-time employed [1)]	1.23	0.54	0.64
Part-time employed [1)]	1.03	0.48	0.94
Not employed [1)]	0.33	0.24	0.13
Prestige [2)]	0.99	0.01	0.45
# of previous partners	**1.13**	0.06	0.03
Constant	0.02	0.02	0.00
2. Long-term	(base outcome)		
3. No intentions			
Age 35–37	**2.34**	0.47	0.00
Women	0.70	0.13	0.06
Women * aged 35–37	**4.37**	1.57	0.00
ToPB factors			
Positive expectations	**0.70**	0.08	0.00
Negative expectations	**1.65**	0.16	0.00
Subjective norm	**0.86**	0.05	0.01
# Prereq. met	0.90	0.06	0.13
Information provided	**0.26**	0.05	0.00
Social structure			
Low education	0.92	0.22	0.74
High education	0.71	0.14	0.09
In training	**0.47**	0.12	0.00
Full-time employed [1)]	0.88	0.36	0.75
Part-time employed [1)]	0.84	0.34	0.67
Not employed [1)]	0.99	0.48	0.99
Prestige [2)]	1.00	0.01	0.76
# of previous partners	**0.90**	0.05	0.05
Constant	2.44	1.40	0.12
Log likelihood	–1145.43		
LR χ^2 (df)	523.40 (32)		
Pseudo R^2	0.19		

Note: Estimates in bold significant at the 0.05 level; [1)] Ref.: unempl.; [2)] = 0 if not full-time/part-time empl.

4.2 The dynamics of fertility intentions

The intensity of fertility intentions changed between the two waves. To find out whether a further polarization of the family planning took place, we first present a mobility table, separately for the younger and the older cohort (Table 3; Total N = 925). An inspection of the row percentages reveals that the stability of the fertility intentions was highest in the no intentions category of the older age group (82%). The results further show that 55% of respondents in this cohort and 52% of respondents in the younger cohort (difference not significant) remain in the category with short-term intentions to have a child. A quarter shift to the medium category leads to one-fifth giving up any fertility plans. The stability of the long-term intentions category is found to be lowest in the older age group and highest in the younger age group. One-fifth of the older respondents in this category switched to the short-term intentions category, while nearly twice as many moved to the no intentions category. While the comparison of the long-term and the no intentions category between cohorts supports our polarization hypothesis, the comparably weak level of stability of the short-term category in the older cohort does not fit this hypothesis completely (Buhr and Kuhnt 2012).

Table 3: Fertility intentions at Wave 1 and Wave 2

Fertility intentions at Wave 1	Fertility intentions at Wave 2			Total
	Short-term	Long-term	No intentions	
25–27 age group				
Short-term	51	43	4	98
Row-percentage	***52.0***	*43.9*	*4.1*	*100*
Long-term	65	307	72	444
Row-percentage	*14.6*	***69.1***	*16.2*	*100*
No intentions	11	47	72	132
Row-percentage	*8.3*	*35.6*	***56.1***	*100*
35–37 age group				
Short-term	36	16	14	66
Row-percentage	***54.6***	*24.2*	*21.2*	*100*
Long-term	18	35	35	88
Row-percentage	*20.4*	***39.8***	*39.8*	*100*
No intentions	7	10	80	97
Row-percentage	*7.2*	*10.3*	***82.5***	*100*

To test our hypotheses 2a–2c, we analyze the change in fertility intentions between Waves 1 and 2 by estimating models for selected subgroups. For each state of the fertility intentions at Wave 1, we investigate the determinants of leaving this state between the two waves. In the longitudinal models we again include gender and age group as well as the interaction term between them. We also include a variable

indicating whether the respondent had found a partner between Waves 1 and 2 and a variable indicating whether the number of prerequisites for starting a family that had been met had increased or decreased. Because of the high correlation with the propensity to enter a partnership between Waves 1 and 2, the number of previous partnerships is not included. In addition, we include level of education, activity status, and psychological factors – namely, self-esteem and conscientiousness. We decided to present odds ratio estimates of a logistic regression without controlling for selection, as the results of the Heckman models suggested that selection bias did not influence the findings.

Table 4 displays the results for the model of leaving the short-term intentions and the no intentions categories. Age group and gender are found to have no influence on leaving the state of short-term fertility intentions, which is also the case for most of the other variables. Some considerable effects by size can be mentioned, even though they are not shown to be significant at the 0.05 level: starting a new partnership has a negative effect on abandoning short-term intentions ($p = 0.11$), while being full-time employed or in training are negatively correlated with leaving the short-term category ($p = 0.11$ resp. $p = 0.08$). We can thus conclude that having delayed childbearing to pursue a career did not cause people to give up on family formation too early.

Table 4: Leaving the state of short-term fertility intentions (n = 164) and no intentions (n = 229)

	Leaving short-term			Leaving no intentions		
	OR	SE	P > z	OR	SE	P > z
35–37 age group	1.15	0.53	0.76	**0.30**	0.15	0.01
Women	1.19	0.52	0.69	1.16	0.53	0.75
Women * aged 35–37	0.40	0.29	0.21	0.57	0.44	0.47
Entered a partnership between Waves 1 and 2	0.51	0.21	0.11	1.93	0.83	0.12
Difference in # of prerequisites met between Waves 2 and 1	0.96	0.13	0.79	1.04	0.18	0.84
Information provided in Waves 2 and 1	0.51	0.29	0.24	**5.31**	1.88	0.00
High education	0,65	0.27	0.32	1.07	0.46	0.87
Low education	0.95	0.55	0.92	0.54	0.32	0.31
In training[1)]	*0.25*	0.20	0.08	0.72	0.45	0.60
Full-time employed[1)]	0.40	0.23	0.11	0.71	0.36	0.50
Part-time employed[1)]	0.75	0.59	0.56	1.23	0.77	0.74
Self-esteem	*0.54*	0.20	0.09	**2.87**	0.96	0.00
Conscientiousness	1.19	0.38	0.58	**1.79**	0.48	0.03
Constant	17.34		0.12	**0.001**		0.00
Log likelihood	–105.40			**–112.80**		
LR χ^2 (df)	15.94 (13)			**64.03 (13)**		
Pseudo R^2	0.07			0.22		

Note: Estimates in bold are significant at the 0.05 level; estimates in italics are significant at the 0.10 level; [1)] Ref. category: others.

Looking at the psychological indicators, we can see that self-esteem is negatively correlated with leaving the short-term intentions status ($p = 0.09$). This finding is in line with the argument that men and women with high self-esteem tend to stick to their plans (H2c), but that conscientiousness has no significant effect. Table 4 also shows that the probability of leaving the state of no intentions was strongly reduced for respondents who were 35 to 37 years old at Wave 1. As expected, we find that having a new partner was associated with rising expectations of having a child. Again, the effect is not found to be significant ($p = 0.12$). Men and women with high levels of self-esteem and conscientiousness are shown to be more likely to leave the status of no fertility intentions. As conscientious people tend to avoid personal risks, leaving the state of no intentions may indicate that the men and women in the sample did not take the risk of missing the optimal time to start a family. Additional analyses (not displayed here) show that these effects are much stronger in the younger age group. This implies that the revision of a decision not to have a child is less associated with personality at an older age than it is in early adulthood. Our finding that explicitly reporting on the prerequisites of parenthood has a large effect on leaving the status of no intentions is surprising. This variable indicates whether the respondent reported on the prerequisites in the second wave and in the first wave at which they said they do not want to have a child. There might be a question of causality here, as the respondents who changed their fertility intentions might have been particularly motivated to reflect on their living conditions.

In Table 5 we display estimates (relative risk ratios) of a multinomial logit regression of leaving the category with long-term intentions between Waves 1 and 2, with remaining in the category as the reference category. As expected, we find that the older respondents were more likely to move from long-term fertility intentions to no intentions, but also from long-term to short-term intentions, even though the respective parameter is not significant at the 0.05 level ($p = 0.06$). Among this older cohort, women were considerably more likely than men to move from long-term to short-term intentions, but the interaction effect is not statistically significant ($p = 0.13$). In any case, these findings point to a polarization of family formation intentions between the waves. In line with hypothesis H2a, having entered partnership increased the chances that a person would move from long-term to short-term fertility intentions. However, in contradiction to H2b, less-educated people were more likely to have shifted to the no intentions category and to the short-term intentions category. Interestingly, conscientiousness is found to be positively correlated with moving to short-term fertility intentions (H2c). None of the models consistently show interaction effects between life course variables or control strategies on the one hand and age, cohort, or gender on the other.

As we cannot control for sample selection in multinomial regression, we estimated separately Heckman selection models for leaving to short-term intentions and leaving to no intentions against staying in the long-term group. A significant correlation between errors in the selection and the choice equation is found in the second model only. However, accounting for selectivity did not change the substantive findings, with the exception that the positive interaction between gender and age group became significant.

Table 5: Leaving the state of long-term fertility intentions (n = 532)

	Leaving to short-term intentions			Leaving to no intentions		
	RRR	**SE**	**P > z**	**RRR**	**SE**	**P > z**
35–37 age group	*2.13*	0.87	0.06	**4.11**	1.38	0.00
Women	1.23	0.37	0.48	0.88	0.27	0.68
Women * aged 35–37	3.46	2.82	0.13	2.14	1.67	0.33
Entered a partnership between Waves 1 and 2	**3.63**	1.03	0.00	0.59	0.23	0.17
Difference in # of prerequisites met between Waves 2 and 1	1.12	0.10	0.20	0.90	0.09	0.28
Information provided in Waves 2 and 1	1.31	0.51	0.48	**0.28**	0.08	0.00
High education	0.83	0.27	0.57	0.86	0.28	0.64
Low education	**2.42**	1.10	0.05	**3.27**	1.25	0.00
In training[1)]	0.79	0.39	0.64	0.83	0.38	0.69
Full-time employed[1)]	1.38	0.61	0.46	1.55	0.62	0.28
Part-time employed[1)]	1.28	0.76	0.67	1.58	0.81	0.37
Self-esteem	1.34	0.35	0.25	0.76	0.17	0.22
Conscientiousness	*1.47*	0.32	0.07	0.97	0.19	0.89
Constant	**0.01**		0.00	1.20		0.86
Log likelihood	–416.26					
LR χ^2 (df)	121.20 (26)					
Pseudo R^2	0.13					

Note: Estimates in bold are significant at the 0.05 level; estimates in italics are significant at the 0.10 level; [1)] Ref. category: others.

4.3 The transition to a partnership

Estimates from a stepwise logit regression model of the transition to both stable and unstable partnerships between Waves 1 and 2 are displayed in Table 6. Model 1 includes fertility intention variables at Wave 1, gender, and age group; and tests for interaction effects of age group and gender (H3b). The likelihood of a partnership at Wave 2 is found to be higher if the respondents had short-term fertility intentions and were in the younger age group. In both age groups, women are shown to be as likely as

men to have a partner, since the main effect for gender and the interaction between gender and age group are not statistically significant. In Model 2 we add as controls a restricted set of socio-structural variables, including number of previous partners and marital status; personality factors; and variables that indicate how intensively respondents were searching for a partner and how they evaluated their partner market situation. These controls are not found to affect the estimated effects for age group and gender.

Table 6: Transition to a partnership (after Wave 1), logistic regression analysis (N = 939)

	Model 1			Model 2 with controls[1)]		
	OR	SE	P > z	OR	SE	P > z
Short-term fertility intentions	1.42	0.28	0.08	1.29	0.28	0.23
No fertility intentions	0.93	0.18	0.72	1.08	0.22	0.71
35–37 age group	**0.52**	0.12	0.01	**0.44**	0.12	0.00
Women	1.35	0.24	0.09	1.24	0.23	0.24
Women * aged 35–37	1.39	0.51	0.37	1.09	0.42	0.83
Constant	**0.35**		0.00	0.71		0.66
Log likelihood	–533.35			–490.16		
LR χ^2 (df)	19.53(5)			105.92(19)		
Pseudo R^2	0.02			0.10		

Note: Estimates in bold are significant at the 0.05 level; [1)] Controls: level of education, employment status, number of previous partners, never married, conscientiousness, extraversion, salience of a partnership, wanting a partner, interested in someone, someone interested in respondent, poor perceived opportunities.

5. Discussion

The aim of this paper was to help us gain a better understanding of the influence of the biological clock on the fertility intentions of men and women who have reached an age when fecundity is declining steeply. We expected to find that these men and women were more likely than their younger counterparts to have either formed a short-term intention to have a child or to have given up on any previous fertility intentions. We indeed found that the family formation intentions of individuals who were facing a deadline for achieving fatherhood or motherhood were more polarized: compared to men and women aged 25–27, respondents aged 35–37 were more likely to have either short-term fertility intentions or no intentions at all. Our results indicated that this pattern was more pronounced for women than for men, and that it held in both a cross-sectional and a longitudinal analysis. The polarized pattern was found to be independent of other factors that, according to the ToPB model, also predict fertility intentions quite

well, such as the value of children, social norms, and perceived behavioral control. We also accounted for the socio-structural differences between respondents without a partner in the two age groups. The only socio-structural variable that was found to have an effect on fertility intentions was being in training. In addition, the results showed that the number of previous partnerships had a positive effect on short-term fertility intentions. Our observation that socio-structural variables had few significant effects is in line with the ToPB, which states that such effects are mediated by people's attitudes, social norms, and perceived behavioral control. Including interactions of ToPB and socio-structural variables with gender or age group did not improve the model fit significantly.

The longitudinal inspection of changes in fertility intentions one year later also confirmed the polarization hypothesis. It revealed that the respondents in the older age category were less likely to leave the state of no intentions and were more likely to move from long-term intentions to no intentions, but were also more likely to move from long-term intentions to short-term intentions, even though the latter effect was only close to significance. Gender was not found to be significant for any moves when the processes between the two waves were analyzed. The childless men and women who entered a partnership were shown to be more likely to hold short-term intentions at Wave 2. For some of the moves, like leaving the state of short-term fertility intentions or the state of no fertility intentions, levels of self-esteem and conscientiousness were revealed to have some explanatory power. In addition, we found that the less educated were more likely to move out of the state of long-term fertility intentions. There was no empirical evidence of an interaction effect between age and gender on the one hand, and life course variables or control strategies on the other. We can therefore conclude that shifts in fertility intentions are less predictable than the intensity of fertility intentions at a given time.

In our study sample, short-term fertility intentions seemed to correlate only moderately with finding a partner. Furthermore, respondents in the older age group were less successful finding a partner than their younger counterparts. Multivariate results confirmed that gender did not affect the likelihood of the transition to a partnership. This finding suggests that people who intensify their intentions are not necessarily more successful in finding a partner, and thus that the nature of the partner market might play a bigger role. It seems that the availability of potential partners decreases with age.

In our study we analyzed short-term changes in the fertility intentions of men and women aged 35–37. Focusing on this age group allowed us to look closely at the dynamics of fertility intentions during a phase in the life course when the pressure to make realistic life plans is building, but the chances of having a child are still reasonably good. This is the first study to show that, in line with theoretical

expectations, when people are aware that their biological clock is ticking and the time to have a child is running out, they are increasingly likely to either form a short-term intention to have a child or abandon their intention to have children altogether. As the phenomenon of the 'biological clock' is universal, we expect that comparable processes of polarization will be observed in other countries. To examine whether this is the case, it would be useful to gather panel data in multiple countries with sufficient numbers of respondents at ages close to the biological deadlines for childbearing.

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Appendix

Table A-1: Descriptives

	Mean/Percentage	Std. Dev.
Fertility intentions (N = 1,442)		
% short-term intention	17.9	–
% long-term intention	69.6	–
% no intention	12.6	–
ToPB factors (N = 1,442)		
Positive expectations	3.57	0.65
Negative expectations	2.52	0.77
Subjective norm	2.52	1.34
# prerequisites met	1.00	1.31
% information on prerequisites provided	81.3	–
Social structure (N = 1,442)		
Age (% 35–37)	25.6	–
Gender (% women)	34.2	–
Level of education		
% low education	10.5	–
% medium education	67.7	–
% high education	21.8	–
Employment status		
% being in training	20.5	–
% full-time employed	56.6	–
% part-time employed	10.3	–
% unemployed	10.4	
% not employed	2.2	–
Prestige	27.67	21.88
# of previous partners	1.60	1.34
Self-esteem	3.19	0.53
Conscientiousness	3.87	0.63
Extraversion	3.38	0.83
% entered a partnership between Waves 1 and 2	26.5	–
% never married	97.2	–
Wanting a partner (% yes)	86.3	–
Salience of partnership	2.64	1.67
% interest in someone	44.3	–
% interest of someone	39.3	–
Poor perceived opportunities	3.04	1.57